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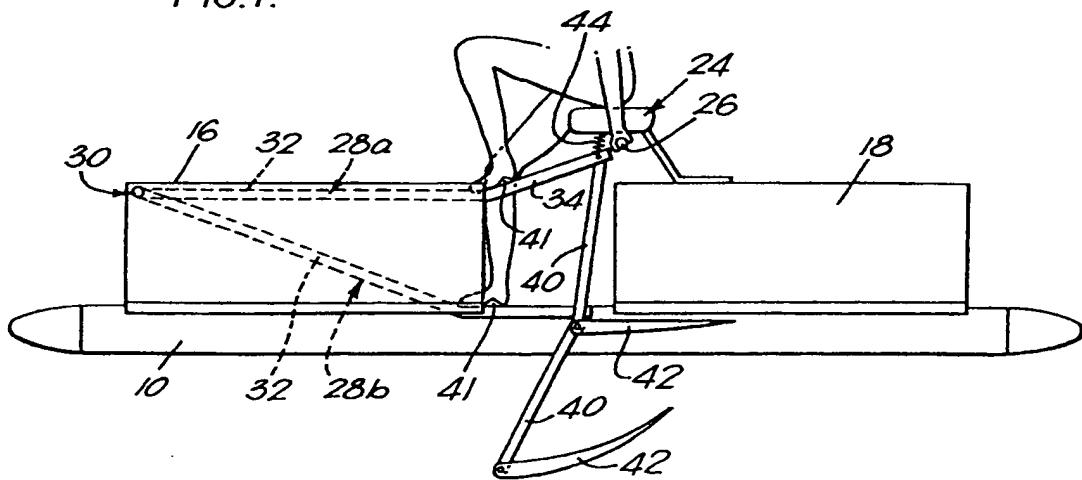
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EP 0158029 A

(58) Field of search
UK CL (Edition J) B7V VAA VBT VBU
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(54) Water-borne craft

(57) A water-borne craft comprises at least two floats (10), a frame (16, 18) therebetween, a seat (24) and propulsion means comprising a pair of cranked foot-plates (28a, 28b) pivotally mounted at the front of the craft and having depending legs (40) with flippers (42) attached thereto. The foot-plates are biased upwards. A propulsive force is generated in response to a substantially vertical "walking" movement of the operator's feet.

FIG.1.

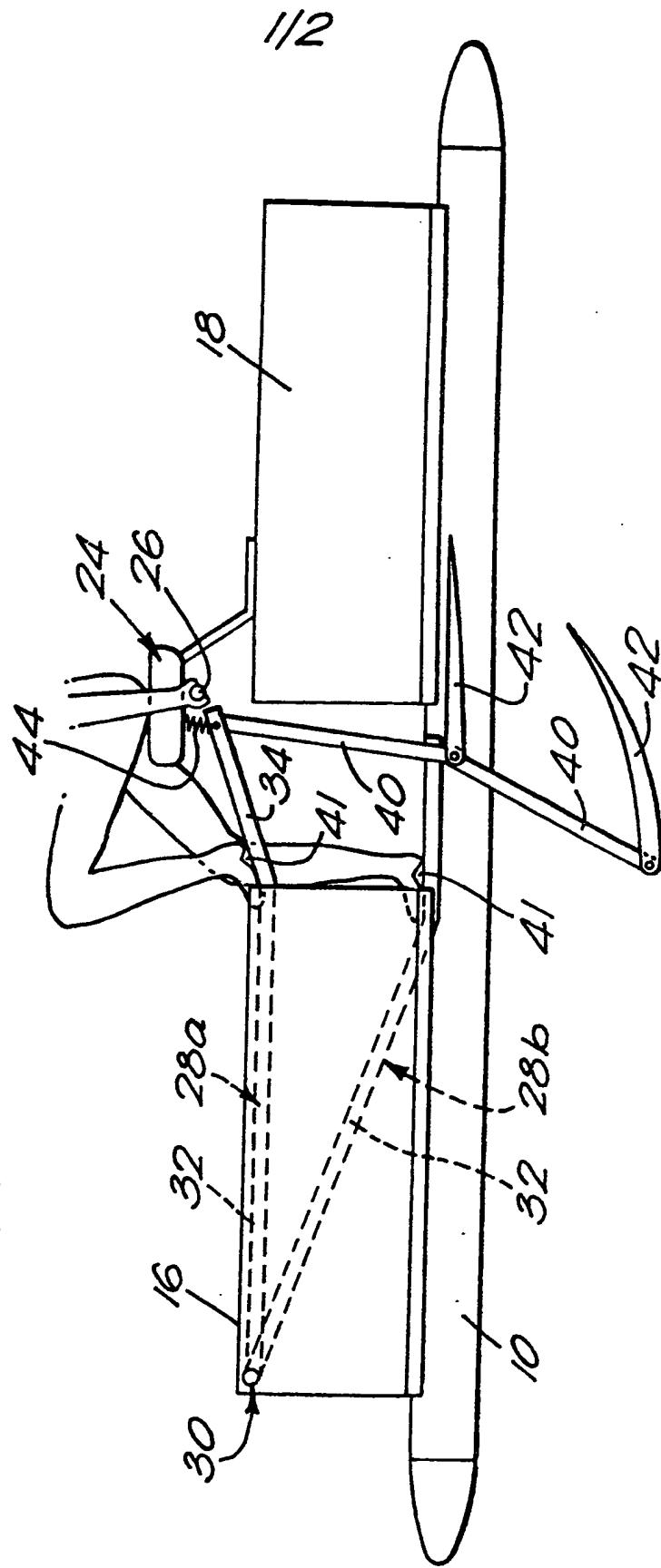


At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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FIG. 1.



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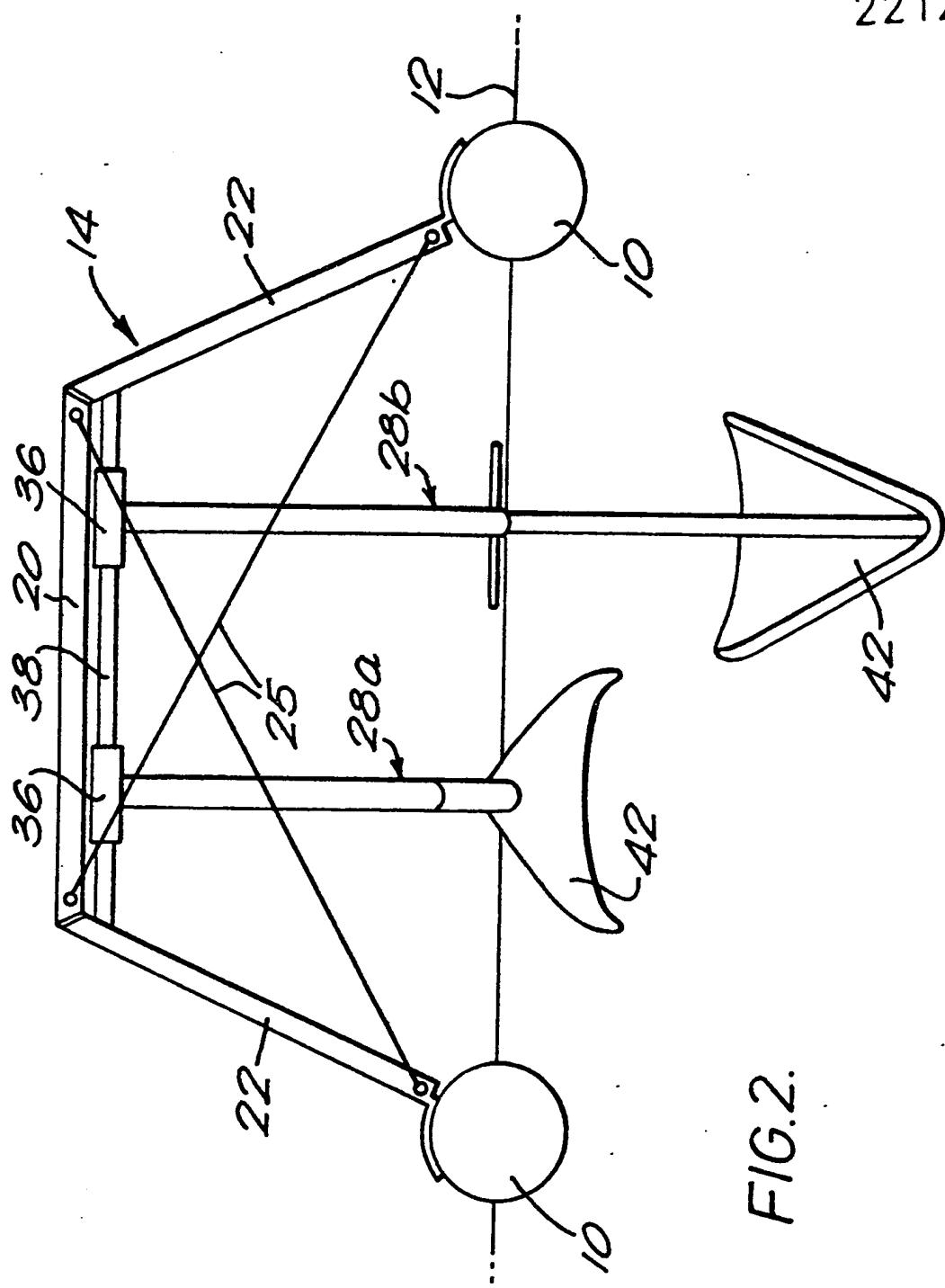


FIG. 2.

WATER-BORNE CRAFTSPECIFICATION

5 This invention relates generally to water-borne craft, and is more particularly concerned with water-borne craft whose motive power is provided by a person or persons sitting on or in the craft, rather than by a motor.

10 Various forms of water-borne craft are known, such as "pedaloes", where a person sitting on or in the craft pushes pedals which are connected by a mechanical linkage to paddle wheels which rotate and thus generate movement through the water. However, the efficiency of
15 such craft is limited.

It is an object of the present invention to provide a water-borne craft adapted to be propelled by human power, which is efficient and manoeuvrable and which has application to a wide number of leisure uses.

20 It is an object of the present invention to provide a water-borne craft which is relatively silent in operation and which therefore has particular attraction for fishermen for example.

Broadly in accordance with the present invention
25 there is provided a water-borne craft comprising at least two float members, frame means extending between the float members and incorporating a seat for the operator, and foot-operated propulsion means comprising one or more flipper elements movable up and down through the water below the float means in response to
30 a substantially vertical movement of the operator's foot or feet.

Preferably, the craft comprises a pair of flipper elements, one operable by each foot and arranged side by side beneath the craft.
35

Preferably, the propulsion means comprises a pair of pivotable foot-plates, each of which is pivotable about an axis which is a substantial distance forward of the operator, thereby to provide a substantial leverage effect. Each foot-plate is provided with a depending leg to which the flipper element or elements is/are attached.

The flipper element or elements are preferably of a flexible material so that the attitude of the flipper element or elements will change as they are moved through the water, thereby to generate the propulsive force for the craft.

In order that the invention may be more fully understood a presently preferred embodiment in accordance with the invention will now be described by way of example and with reference to the accompanying drawings, in which:

Fig. 1 is a schematic side view of the craft, with parts shown broken away and illustrating the position where one foot is raised and one foot is lowered; and,

Fig. 2 is a transverse section through the craft shown in Fig.1.

As shown in the drawings, the water-borne craft comprises a pair of floats or pontoons 10. The water line is indicated at 12. A frame, indicated generally at 14, connects the floats 10 and bridges the space between them. The frame 14 comprises a forward part 16 and a rearward part 18 with a gap therebetween which is substantially amidships. Each of the frame portions 16 and 18 comprises a flat top plate 20 and a pair of sloping side plates 22 which are secured to the respective floats 10. A seat indicated generally at 24 is mounted towards the forward end of the rear frame portion 18 and is positioned so that a person sitting on the seat 24 can position his legs comfortably within

the central "cockpit" between the two frame portions. The seat 24 incorporates a pair of bars 26, one on each side of the seat, for the operator to grasp when propelling the craft. Bracing wires 25 extend between 5 the top plate 20 and the side plates 22.

A pair of elongate foot-plates 28a and 28b are mounted at the forward end of the front portion 16 of the frame by hinged joints 30. Each foot-plate 28a, 28b has a straight front portion 32 of a length which 10 is substantially equal to the length of the front frame portion 16, and a shorter rear portion 34 which is angled upwards relative to the front portion 32 as is indicated clearly in Fig. 1. As shown in Fig. 2, the hinge joints 30 may comprise respective sleeves 36 15 attached to the foot-plates and mounted on a transverse shaft 38 for pivotable movement relative thereto.

A depending leg 40 is secured adjacent to the rearward end of each foot-plate 28a, 28b and extends 20 downwards at a fixed angle relative to the foot-plate. This angle is preferably such that the depending leg 40 is substantially vertical when the foot-plate 28a, 28b is in its maximum upward position, as is indicated for the foot-plate 28a in Fig. 1. At the bottom of each 25 depending leg 40 there is fitted a flipper element 42. These flipper elements 42 are made of a suitable flexible material so that as the foot-plates 28a and 28b are moved up and down by pressure from the operator's feet the flipper elements will execute a 30 corresponding movement up and down within the water and will generate a propulsive force for the craft. The shape and configuration of the flipper elements 42 is a matter of choice, but a generally triangular configuration has been found to be particularly 35 effective.

A return spring 44 is connected between the bottom of the seat 24 and the rearward end of each foot plate 28a, 28b, so that the foot plate is returned to its upper position when downward pressure is not being exerted on that foot plate by the operator.

The area of the foot-plates 28a, 28b towards the rearward end where the feet are placed is preferably provided with a suitable non-slip surface. This may include a rib 41 to help locate the foot.

As will be clearly apparent from Fig. 1, in order to propel the craft forward, it is simply necessary for the person sitting on the seat 24 to press vertically downwards on the foot plates 28a, 28b in turn, in the manner of a walking movement. This will cause the foot-plates to be depressed to their lower position and will cause the flipper elements to move down through the water. When downward pressure on one of the foot-plates is removed by the operator the spring 44 will cause the foot-plate to rise to the upper position again with the flipper element then rising through the water. This upward and downward movement of the flipper elements will cause forward motion of the craft.

It is an important feature of the present invention that the pivot for the foot-plates 28a and 28b is as far forward as possible within the craft. This reduces the strain on the operator when depressing the foot-plates. As can be seen from Fig. 1, each foot-plate pivots through an angle of the order of 30 degrees between its upper and lower positions.

The water-borne craft of the present invention can be made from any suitable materials, and the particular sizes and shapes of the component parts may differ from those shown in the particular example which has been described above with reference to the drawings.

Although the craft preferably has two foot-plates and two flippers, one to be operated by each foot, it would alternatively be possible to have a single central foot-plate equipped with a flipper and designed just
5 for simple upward and downward movement either by one foot or by two feet together.

A water-borne craft made in accordance with the invention is highly efficient and effective at propelling the craft in a substantially silent manner
10 without the sort of disturbance of the water which is generated by a rotary paddling motion.

CLAIMS:

1. A water-borne craft comprising at least two float members, frame means extending between the float members and incorporating a seat for the operator, and
5 foot-operated propulsion means comprising one or more flipper elements movable up and down through the water below the float means in response to a substantially vertical movement of the operator's foot or feet.
- 10 2. A craft in accordance with claim 1, comprising a pair of flipper elements, one operable by each foot and arranged side by side beneath the float members.
- 15 3. A craft in accordance with claim 1 or 2, in which the flipper element or elements is/are of a flexible material so that the altitude of the flipper element or elements changes as the element or elements is/are moved through the water, thereby to generate the propulsive force for the craft.
- 20 4. A craft in accordance with any preceding claim, in which the or each flipper element is substantially triangular in shape.
- 25 5. A craft in accordance with any preceding claim, in which the propulsion means comprises a pair of pivotable foot-plates, each of which is pivotable about an axis which is a substantial distance forward or rearward of the operator's seat.
6. A craft in accordance with claim 5, in which said pivot axis or axes is/are at the forward end of the frame means.
- 30 7. A craft in accordance with claim 5 or 6, in which each foot-plate comprises an elongate cranked lever with an upwardly rising portion at the rearward end thereof and with the operator's foot arranged to be placed adjacent to the position where the foot-plate is cranked.

8. A craft in accordance with claim 5, 6 or 7, in which each foot-plate is provided with a depending leg to which the flipper element or elements is/are attached.

5 9. A craft in accordance with claim 8, in which the depending leg is provided adjacent to the rearward end of the foot-plate and extends downwards and forwards at a fixed angle relative to the foot-plate.

10 10. A craft in accordance with claim 9, in which said angle is such that the depending leg is substantially vertical when the foot-plate is in its position of maximum upward pivotal movement.

15 11. A craft in accordance with any of claims 5 to 10, in which each foot-plate pivots through an angle of the order of 30°.

12. A craft in accordance with any of claims 5 to 11, which includes spring means urging the foot-plates towards their position of maximum upward displacement.

20 13. A craft in accordance with claim 12, in which said spring means is connected between the seat and the rearward end of each foot-plate.

25 14. A craft in accordance with any preceding claim, in which the frame means comprises a forward part and a rearward part with a gap therebetween, with the seat mounted on or to the forward end of the rearward part.

15. A craft in accordance with claim 14, in which each said frame part comprises a generally flat top plate and a pair of downwardly sloping side plates.

30 16. A water-borne craft substantially as hereinbefore described with reference to the accompanying drawings.